

## REMARKS

Reconsideration and allowance in view of the foregoing amendments and the following remarks are respectfully requested.

As set forth above, **Claims 8, 11 – 14, 16 – 19, and 21 – 23** remain pending for examination.

Unless noted below, the current amendments to the claims are only editorial in nature, and are intended to correct informalities or inconsistencies regarding grammar or formatting. Among such current amendments, **Claims 21 and 23** are amended to correctly depend from **Claim 16**. Otherwise, to the extent that any of the current amendments affect the scope of the respective claim, such amendment will be discussed below. Favorable consideration is requested.

### Rejections under 35 U.S.C. §103(a)

The following rejections under 35 U.S.C. §103(a) were issued in the outstanding Final Office Action:

- (a) **Claims 8 and 11 – 14** were rejected as being unpatentable over Awater, *et al.*, (U.S. Patent 6,175,551; hereafter “Awater”) in view of Schenk (U.S. Patent 6,529,925; hereafter “Schenk”) and Henkel, *et al.*, (U.S. Publication “PAR Reduction Revisited: An Extension of Tellado’s Method”; hereafter “Henkel”).
- (b) **Claims 16 – 19 and 21 – 23** were rejected as being unpatentable over Awater in view of Henkel.

The Applicants respectfully traverse both of rejections (a) and (b) and further request that both rejections be reconsidered and withdrawn.

Independent **Claim 8** recites, with emphasis added:

A method for reducing the crest factor of a data symbol to be transmitted in a multi-carrier data transmission system, the data symbol being a function of a plurality of signals provided within a predetermined data frame, each of the plurality of signals allocated to a carrier, each carrier occupying at least one frequency from a transmit data spectrum, **at least one carrier being reserved which is not provided for the data transmission**, the method comprising:

receiving the predetermined data frame, the predetermined data frame exhibiting the data symbol and a cyclic prefix which is derived from a part of the data symbol; and

performing crest factor reduction corresponding to the predetermined data frame based at least in part on peak values within the cyclic prefix of the predetermined data frame, by:

(a) **filtering the data symbol and the cyclic prefix;**

(b) **determining whether a time-domain function of the data symbol and of the cyclic prefix within the predetermined data frame exhibits at least one peak value that exceeds a first threshold;**

(c) **determining an amplitude of an exhibited peak value and an associated position within the predetermined data frame;**

(d) **generating a correction function by scaling and transposing a sample correction function in dependence on the amplitude and associated position of the exhibited peak value;**

(e) **using the at least one carrier which is not available for data transmission for generating the sample correction function in the time domain; and**

(f) **modifying the data symbol to be transmitted by superimposing the correction function.**

The portions highlighted in the above listing of Claim 8 are those features acknowledged in the outstanding rejection as not being disclosed by Awater.

While the Applicants do not presently disagree with the assertion made in the rejection that Schenk discloses "where at least one carrier being reserved which is not provided for the data transmission ([Schenk] Col. 1, lines 438 – 60)," the Applicants disagree that Henkel is able to compensate for, at least, the acknowledged deficiencies of Awater regarding the remaining highlighted portions of independent **Claim 8** that are recited *within* the recitation of "performing crest factor reduction..."

More particularly, the rejection points to the description at Page 31-2 through Page 31-3 of Henkel as disclosing the portions highlighted above in the partial listing of Awater. As stated above, the Applicants respectfully disagree.

At Page 31-2, col. 2, Henkel states:

...If the [frequency] bins are chosen at random, after a certain number of trials, one is able to find a set of such bins that shows a sufficient peak compared to the sidelobes in the corresponding time-domain vector.

Henkel continues by describing a "Dirac-like time domain signal "p" that comprises the frequency bins that are compared to a corresponding time-domain vector in order to find a set that shows a sufficient peak.

Still, the Applicants submit that there is no description on Page 31-1, or elsewhere, of the following features of **Claim 8**:

**(b) determining whether a time-domain function of the data symbol and of the cyclic prefix within the predetermined data frame**

**exhibits at least one peak value that exceeds a first threshold;**

The reference does not specify that *it is a time-domain function of the data symbol and of the cyclic prefix* within the predetermined data frame that exhibits at least one peak value that exceeds a first threshold or even that a determination is made as to whether the time-domain function exhibits at least one peak value exceeding a first threshold value.

Further, at Page 31-2, col. 2, Henkel describes, with reference to Figure 4:

The uppermost blocks locate the peak of the oversampled Dirac-like function. The subsequent block with rounded edges realizes a time shift to zero and the neighboring  $L - 1$  positions...The shift to zero is required, since an arbitrary filter response will also place the peak of the Dirac-like function to some arbitrary position.

The Applicants submit, though, nowhere in this description, or elsewhere in Henkel, is there a sufficient disclosure to teach, or even suggest, the claimed feature of:

**(c) determining an amplitude of an exhibited peak value and an associated position within the predetermined data frame.**

Even further, though Henkel describes, at Page 31-2, col. 1, that the shift in the oversampled signal is realized by the (circular) time shift property of a particular DFT transform, there is still no disclosure that is even suggestive of:

**(d) generating a correction function by scaling and transposing a sample correction function in dependence on the amplitude and associated position of the exhibited peak value.**

Accordingly, in view of, at least, the foregoing deficiencies of Henkel, it is respectfully submitted that the proposed combination of Awater, Shenk, and Henkel is altogether incapable of even suggesting the following more comprehensive recitation from **Claim 8**:

**performing crest factor reduction  
corresponding to the predetermined data frame  
based at least in part on peak values within the  
cyclic prefix of the predetermined data frame.**

Therefore, it is respectfully submitted that independent **Claim 8**, as well as corresponding dependent **Claims 11 – 14**, are patentable over the proposed combination of references, and so the current rejection (a) under 35 U.S.C. §103(a) should be reconsidered and withdrawn.

Independent **Claim 16** recites, with emphasis added:

A method for reducing the crest factor of a data symbol to be transmitted in a multi-carrier data transmission system, the data symbol being a function of a plurality of signals provided within a predetermined data frame, each of the plurality of signals allocated to a carrier, each carrier occupying at least one frequency from a transmit data spectrum, the method comprising:

(a) receiving the predetermined data frame, the predetermined data frame having the data symbol and a prefix which is derived from a part of the data symbol;

(b) **performing crest factor reduction corresponding to the predetermined data frame by determining an amplitude of an identified peak value and an associated position within the predetermined data frame;** and

(c) **generating a correction function by scaling and transposing a sample correction function in dependence on the amplitude and associated position of the identified peak value**

**and using at least one carrier which is not available for data transmission for generating the sample correction function in the time domain.**

The portions highlighted in the above listing of **Claim 16** are those features acknowledged in the outstanding rejection as not being disclosed by Awater. The Applicants submit that the description provided by Henkel is insufficient to compensate for such deficiencies.

For example, at Page 31-2, col. 2, Henkel describes, with reference to Figure 4:

The uppermost blocks locate the peak of the oversampled Dirac-like function. The subsequent block with rounded edges realizes a time shift to zero and the neighboring  $L - 1$  positions...The shift to zero is required, since an arbitrary filter response will also place the peak of the Dirac-like function to some arbitrary position.

The Applicants submit, though, nowhere in this description, or elsewhere in Henkel, is there a sufficient disclosure to teach, or even suggest, the claimed feature of:

**(b) performing crest factor reduction corresponding to the predetermined data frame by determining an amplitude of an identified peak value and an associated position within the predetermined data frame.**

Further, though Henkel describes, at Page 31-2, col. 1, that the shift in the oversampled signal is realized by the (circular) time shift property of a particular DFT transform, there is still no disclosure that is even suggestive of:

**(c) generating a correction function by scaling and transposing a sample correction function in dependence on the amplitude and associated position of the identified peak value**

and using at least one carrier which is not available for data transmission for generating the sample correction function in the time domain.

Accordingly, in view of, at least, the foregoing deficiencies of Henkel, it is respectfully submitted that the proposed combination of Awater and Henkel is altogether incapable of even suggesting the current recitation of **Claim 16**.

Therefore, it is respectfully submitted that independent **Claim 16**, as well as corresponding dependent **Claims 17 – 19 and 21 - 23**, are patentable over the proposed combination of references, and so the current rejection (b) under 35 U.S.C. §103(a) should be reconsidered and withdrawn.

Conclusion

The remaining references of record have been studied. It is respectfully submitted that they do not compensate for the deficiencies of the references utilized in rejecting the currently pending claims.

All objections and rejections having been addressed, the Applicants submit that the present application is in condition for allowance, and therefore early and forthright issuance of a Notice to that effect is earnestly solicited.

Respectfully Submitted,  
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